EXAMPLE 2

The following example illustrates the effectiveness of a hydrophobic finish material applied to a fibrous mat facing material in preventing the penetration of a cementitious slurry through the fibrous mat.

Talc powder (Talcron 40-26, particle size 5 microns) dispersed in water containing 0.05 wt. % tri-potassium polyphosphate (dispersant) at various solid loading levels and viscosities is applied to non-woven glass fiber mats to coat the mats at a thickness of 5 mil or 15 mil (based on wet film thickness). The solid loading level, viscosity, and thickness of the finishes are provided in Table 2. Finishes 5-7 also contain a hydroxyethylcellulose viscosity enhancer (0.05 wt. %). Finish 7 further includes 1 wt. % white wax. Thereafter, a cementitious slurry is deposited over the finish material.

TABLE 2

Finish	Thickness (mil)	Solids (%)	Viscosity (KU)	Results
1	5	50	70	Reduced slurry penetration
2	15	50	70	No slurry penetration
3	5	60	119	No slurry penetration
4	15	60	119	No slurry penetration
5	5	20	83	Reduced slurry penetration
6	15	20	83	Reduced slurry penetration
7	5	20	83	Reduced slurry penetration
8 (control)	(n/a)	(n/a)	(n/a)	High degree of slurry penetration

The amount of slurry penetration is visually inspected and compared to a control, which is provided by applying the same slurry to a glass fiber mat that is identical to the mats used to test finishes 1-7, but comprises no finish material.

By comparison to the control mat, a lesser amount of slurry will penetrate the mats comprising a finishing material, showing that the application of a hydrophobic finish to a fibrous mat facing material reduces or eliminates slurry penetration through the fibrous mat.

EXAMPLE 3

The following example illustrates the preparation of a water-resistant cementitious article in accordance with the invention.

A cementitious slurry is prepared using the formulation provided in Table 1 in a board mixer. The siloxane component of the slurry is dispersed in water (e.g., 4.1-4.4 wt. % siloxane in water dispersion) using a 312/45 MS high shear mixer (20 hp, 3600 RPM) manufactured by Silverson Machines, Inc., East Longmeadow, Mass.), and introduced into the gauging water used to prepare the slurry. The siloxane dispersion is introduced into the board mixer in an amount sufficient to provide a final cementitious product comprising 11 lb. siloxane/msf board (about 0.43% wt./wt.). The slurry is used in conjunction with standard manufacturing processes to produce a paper-faced board product that passes the ASTM C1396/C 1396M-06 2-hour immersion target for sheathing without board defects of 10% and for water resistant gypsum backing board of 5% using ASTM Standard Test Method C 473.

A second cementitious slurry is prepared in the same manner, except that an X-Series High Shear Mixer ME-430XS-6 manufactured by Charles Ross & Son Company, Hauppauge, N.Y. instead of the Silverson mixer, and the siloxane dispersion is added to the board mixer in an amount sufficient to provide a final cementitious produce comprising 10 lb. siloxane/msf board (about 0.39% wt./wt.). The slurry is used in conjunction with standard manufacturing processes to produce a paper-faced board product that passes the C1396/C 1396M-06 2-hour immersion target for sheathing without board defects of 10% and for water resistant gypsum backing board of 5% using ASTM Standard Test Method C 473.

In order to produce a product that passes the ASTM C1396 standard using conventional processes, higher levels of siloxane typically are required (e.g., on the order of 12.5 lbs. siloxane/msf or about 0.5% wt./wt.). The foregoing example illustrates that preparing a water-resistant cementitious article in accordance with the invention can be advantageously be used with a lower siloxane loading level.

All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

Preferred embodiments of this invention are described herein. Variations of those preferred embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description, without departing from the spirit and scope of the invention. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.

The invention claimed is:

1. A method of preparing a water-resistant cementitious article comprising

(a) preparing an aqueous siloxane dispersion comprising from about 4 wt. % to about 8 wt. % siloxane in water, wherein the aqueous siloxane dispersion comprises dispersed siloxane particles having an average particle size of less than about 50 microns, and does not comprise an emulsifier or dispersant;

(b) combining the siloxane dispersion with a cementitious mixture to provide a cementitious slurry,

(c) depositing the cementitious slurry onto a substrate, and

(d) allowing the cementitious slurry to harden, thereby providing a water-resistant cementitious article.

2. The method of claim **1**, wherein the siloxane particles, have, an average particle size of less than about 30 microns.

3. The method of claim **1**, wherein the aqueous siloxane dispersion is added to the cementitious mixture in an amount sufficient to provide about 0.3 wt. % to about 2 wt. % siloxane based on the weight of the hardened, dried cementitious slurry.

4. The method of claim **1**, wherein the cementitious mixture comprises solid components and liquid components, and the siloxane dispersion is first combined with a liquid component of the cementitious mixture and subsequently combined with the solid components of the cementitious mixture.

5. The method of claim **1**, wherein the substrate is a first fibrous mat comprising polymer or mineral fibers.

6. The method of claim **5**, wherein the first fibrous mat comprises a hydrophobic finish and the cementitious slurry is deposited on the hydrophobic finish.

7. The method of claim **5**, wherein the method further comprises depositing a hydrophobic finish on the fibrous mat before depositing the cementitious slurry on the first fibrous mat.

8. The method of claim **7**, wherein the method further comprises drying the hydrophobic finish before depositing the cementitious slurry on the first fibrous mat.